

**§ 572.124 Thorax assembly and test procedure.**

(a) *Thorax (upper torso) assembly.* The thorax consists of the part of the torso assembly shown in drawing 127–2000.

(b) When the anterior surface of the thorax of a completely assembled dummy (drawing 127–0000) is impacted by a test probe conforming to section 572.127(a) at  $6.71 \pm 0.12$  m/s ( $22.0 \pm 0.4$  ft/s) according to the test procedure in paragraph (c) of this section:

(1) The maximum sternum displacement (compression) relative to the spine, measured with chest deflection transducer (drawing SA572–S50), must be not less than 38.0 mm (1.50 in) and not more than 46.0 mm (1.80 in). Within this specified compression corridor, the peak force, measured by the probe in accordance with section 572.127, shall not be less than 1150 N (259 lbf) and not more than 1380 N (310 lbf). The peak force after 12.5 mm (0.5 in) of sternum displacement but before reaching the minimum required 38.0 mm (1.5 in) sternum displacement limit shall not exceed 1500 N (337.2 lbf).

(2) The internal hysteresis of the ribcage in each impact as determined by the plot of force vs. deflection in paragraph (b)(1) of this section shall be not less than 65 percent but not more than 85 percent.

(c) *Test procedure.* The test procedure for the thorax assembly is as follows:

(1) Soak the dummy in a controlled environment at any temperature between 20.6° and 22.2 °C (69° and 72 °F) and a relative humidity between 10 and 70 percent for at least four hours prior to a test.

(2) Seat and orient the dummy, wearing tight-fitting underwear or equivalent consisting of a size 5 short-sleeved shirt having a weight less than 0.090 kg (0.2 lb) and an opening at the top just large enough to permit the passage of the head with a tight fit, and a size 4 pair of long pants having a weight of less than 0.090 kg (0.2 lb) with the legs cut off sufficiently above the knee to allow the knee target to be visible, on a seating surface without back support as shown in Figure N4, with the limbs extended horizontally and forward, parallel to the midsagittal plane, the midsagittal plane vertical within  $\pm 1$  degree and the ribs level in the anterior-

posterior and lateral directions within  $\pm 0.5$  degrees.

(3) Establish the impact point at the chest midsagittal plane so that the impact point of the longitudinal centerline of the probe coincides with the midsagittal plane of the dummy within  $\pm 2.5$  mm (0.1 in) and is  $12.7 \pm 1.1$  mm ( $0.5 \pm 0.04$  in) below the horizontal-peripheral centerline of the No. 3 rib and is within 0.5 degrees of a horizontal line in the dummy's midsagittal plane.

(4) Impact the thorax with the test probe so that at the moment of contact the probe's longitudinal center line falls within 2 degrees of a horizontal line in the dummy's midsagittal plane.

(5) Guide the test probe during impact so that there is no significant lateral, vertical or rotational movement.

(6) No suspension hardware, suspension cables, or any other attachments to the probe, including the velocity vane, shall make contact with the dummy during the test.

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**§ 572.125 Upper and lower torso assemblies and torso flexion test procedure.**

(a) *Upper/lower torso assembly.* The test objective is to determine the stiffness effects of the lumbar spine (drawing 127–3002), including cable (drawing 127–8095), mounting plate insert (drawing 910420–048), nylon shoulder bushing (drawing 9001373), nut (drawing 9001336), and abdominal insert (drawing 127–8210), on resistance to articulation between upper torso assembly (drawing 127–2000) and lower torso assembly (drawing 127–3000).

(b)(1) When the upper torso assembly of a seated dummy is subjected to a force continuously applied at the head to neck pivot pin level through a rigidly attached adaptor bracket as shown in Figure N5 according to the test procedure set out in paragraph (c) of this section, the lumbar spine-abdomen assembly shall flex by an amount that permits the upper torso assembly to translate in angular motion until the machined rear surface of the instrument cavity at the back of the thoracic spine box is at  $45 \pm 0.5$  degrees relative to the vertical transverse plane, at which time the force applied as shown